NEWS SCIENCE NEWS

FUEL FROM "BURNING WATER"

from The Freedom Reclamation Project
via KeelyNet, January 2002

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We have no indication that these plans work or will work as claimed when built; so if you choose to try it, use common sense and start *small*, like with a lawnmower engine. Please report any successes you may have to KeelyNet at http://www.keelynet.com.

Preliminary Plans

These plans can be used to run your car, truck, RV, motorcycle, airplane, etc. from *tap water*. You will be making use of your entire existing system, except for the fuel tank and the catalytic converter.

This 'mini-system' runs easily from your existing battery and electrical system, and it plugs into your carburettor with simple off-the-shelf fittings.

You will be installing a plastic water tank, a control circuit, a reaction chamber, a high-pressure carb/FI fitting and three gauges (see figure 1), and then hooking into your existing carburettor/fuel injector.

The *simplicity* comes from being an 'on-demand' system requiring no fancy storage or plumbing. You crank the gas pedal or throttle and you electrically create more vapour for immediate consumption on demand: low to high flow rate as needed, from idle to maximum power.

Frequently Asked Questions

Q: Does it really work?

A: Yes; this is well-established technology dating back to stainless steel. But be sure to follow these instructions using the proper mechanical and electrical assembly techniques, as it incorporates the best qualities of several techniques.

Q: How does it qualify as 'free energy'?

A: If you're paying someone for the water you use, then it is not strictly 'free'.

Q: Is it safe?

A: Technically, it is safer than running on fossil fuel because you are no longer choking on your own emissions (healthwise), but in general it is practically as safe as your current gasoline arrangement. You will be installing a few simple safety devices, using current automotive standards.

Q: What kind of performance can I expect?

A: Properly adjusted, your modified vapour-only fuel system will run cooler, and at a modestly higher power level. The mileage performance expected from this design ranges from 50–300 mpg, depending on your adjusting skills.

Q: Can I do the modification myself?

A: Why not! If you know someone with basic mechanical and/or electrical skills, you can even delegate some of the construction. If you are using a fuel-injected engine, you may have to get a mechanic's opinion.

Q: What is the environmental impact that my vehicle will have?

A: It will be producing H_2O steam and unburnt O_2, hence it will be cleaning the environment rather than dumping nauseous toxins into it. Plus, you will be helping to save our dwindling supply of atmospheric oxygen. Any excess vapour in the reaction becomes either steam or oxygen. You can also expect to be receiving more than casual interest from those around you.

Q: Is this really a steam engine?

A: Not really. Exceedingly high temperature and pressure are not used. This is strictly an internal combustion engine (burning orthohydrogen) with residual steam in the exhaust as a byproduct. Note that gasoline as a fuel is optional.

Important Notes about Gasoline

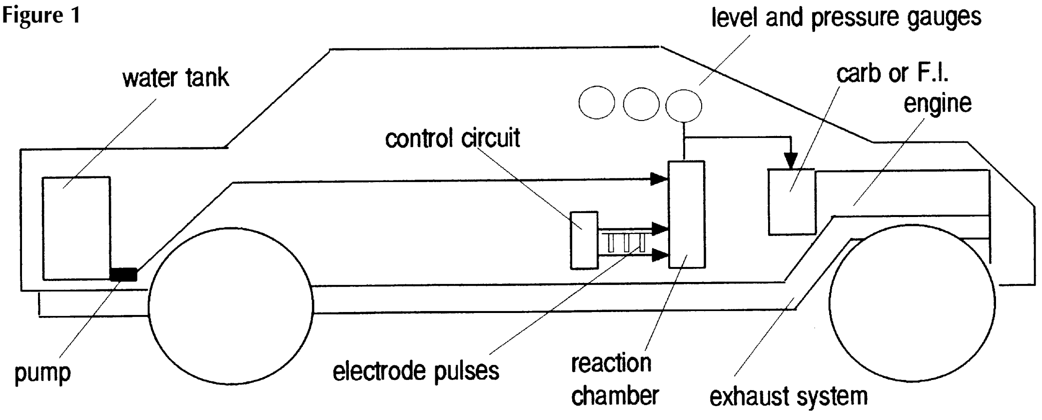
1. Origin: In the 19th century, the gasoline portion of the refining process was first considered to be a 'waste' product of extracting the purified crude oil. Later on, it was discovered that it could be sold as fuel, instead of just dumping it back in the hole, as had been the tradition.

2. Consumption Rate: The gasoline consumption rate for every mass-produced car has been carefully 'designed in' as a market asset. As an indication, simply observe how quickly and closely *all* the local different gas stations adjust their prices. Even the hybrid cars which use electric motors still consume a designed amount of gasoline, and their price tags are prohibitively high.

3. Efficiency: There is a lot of thermochemical energy in gasoline, but there is even more energy in water. The US Department of Energy has quoted it at about 40%, so it is probably much more than that.

Most people are unaware that *internal combustion* is defined as a *thermo-vapour process*, as in 'no liquid in the reaction'; and that most of the gasoline in a standard internal combustion engine is actually *consumed*

Figure 1



(cooked and finally broken down) *in the catalytic converter*, which happens *after* the fuel has been not-so-burned in the engine. Sadly, this means that most of the fuel we use in this way is used only to cool down the combustion process, when we could be using a cleaner and more efficient means to do this.

4. Additives: Also, sadly, we are told by 'authorities' that some of the many gasoline additives are in the mix to increase performance; but because of its current overly complex molecular structure, the real built-in function of the gasoline formula is to slow down the combustion so that only so much is actually consumed in the cylinder, and the liquid balance goes to the catalytic converter. As a further insult, the additives are also there to clog and prevent the use of the Pogue-style carburettors, designed to get 200–300 mpg.

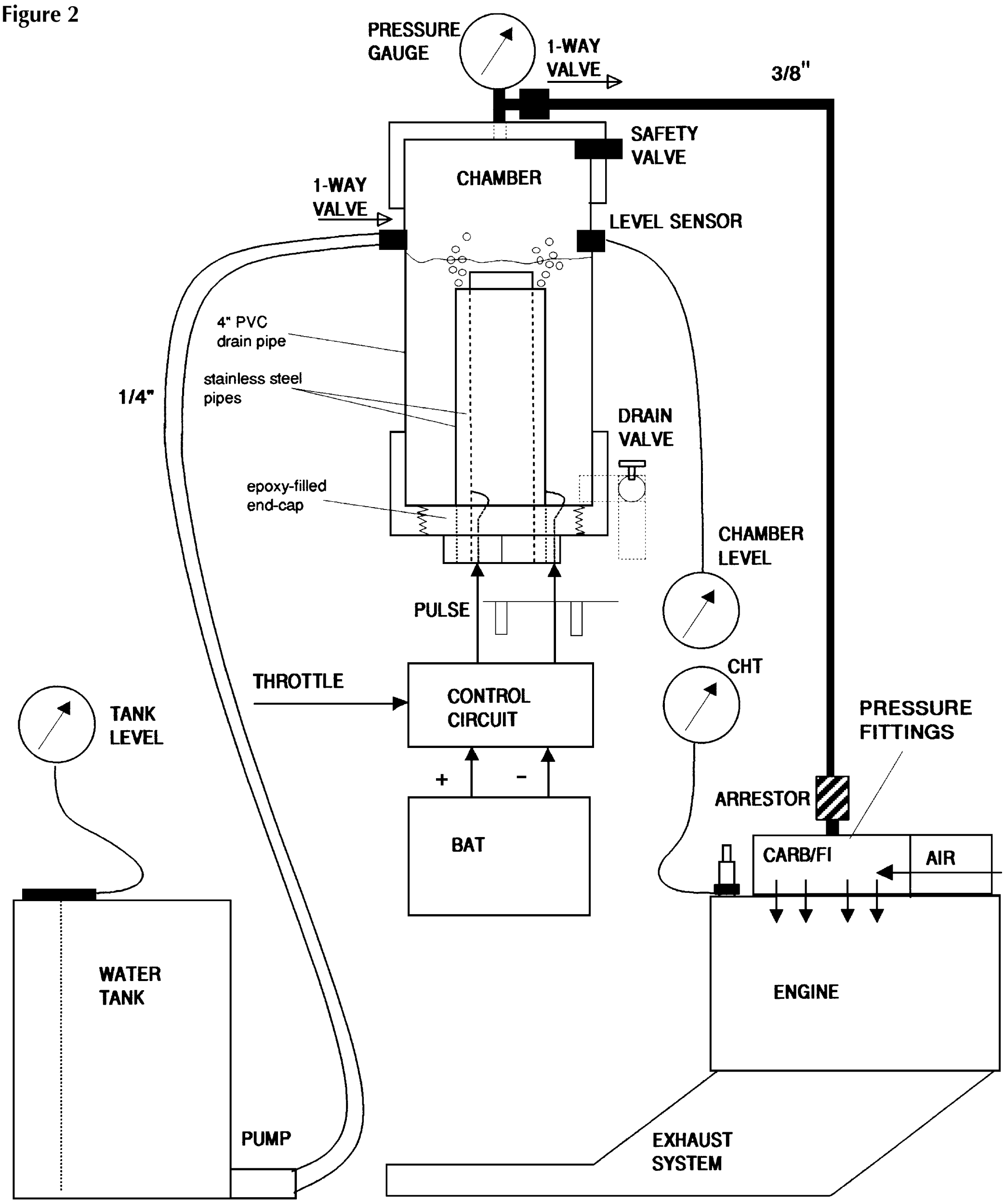
How the Vapour System Works

The system is exceedingly simple. Water is pumped as needed to replenish and maintain the liquid level in the chamber. The electrodes are vibrated with a 0.5–5 amp electrical pulse which breaks down $2(H_2O)$ into $2H_2 + O_2$.

When the pressure reaches, say, 30–60 psi, you turn the key and go. You step on the pedal, you send more energy to the electrodes and thus more vapour to the cylinders—i.e., fuel vapour on demand. You set the idle to maximum flow rate to get the most efficient use of power, and you're off to the races.

In the *big* picture, your free energy is coming from the tap water, in an open system, as the latent energy in the water is enough to power the engine and hence drive the alternator and whatever belt-driven accessories, *and* the alternator is efficient enough to run the various electrical loads (10–20 amps), including the additional low current to run this vapour reaction. No extra batteries are required.

Figure 2



Construction Steps

Here is the suggested sequence of steps (see figures 1 and 2):

1. Install the CHT (cylinder head temp) or EGT (exhaust gas temp) gauge and measure your current operating temperature range (gasoline) for comparison.

2. Build and test the controller to verify the correct pulse output.

3. Build the reaction chamber and test it with the controller (i.e., pressure out).

4. Install the tank, controller, chamber and pressure fittings.

5. Run engine and adjust the control circuit as necessary for best performance.

6. Install the stainless steel valves and get the pistons/cylinders coated with ceramic.

7. Coat the exhaust system with ceramic without the catalytic converter, or let it rust out and replace the whole thing with stainless steel pipe sections.

Construction Checklist

You will need the following items: • plastic water tank with pump and level sensor • control circuit, wiring, connectors and epoxy • reaction chamber with electrodes and fittings • 3/8" stainless steel flex tubing, fittings and clamps • carb/FI vapour-pressure fitting kit • pressure, CHT (or EGT) and level gauges • stainless steel valves • copper mesh junction • ceramic surface treatment for cylinders and pistons • stainless steel or ceramic-treated exhaust assembly • drill, screwdriver and pliers • hole cutter • wire wrap, solder iron and clippers • DVM and oscilloscope.

Reaction Chamber

Construct as shown in figure 2. Use a section of 4" PVC waste pipe with a threaded screw-cap fitting on one end and a standard end-cap at the other. Make sure to drill and epoxy or tap threads through the PVC components for all fittings.

Set and control the water level in the chamber so that the water submerses the pipe electrodes well; yet leave some headroom to build up the hydrogen/oxygen vapour pressure. Use stainless steel wires inside the chamber, or otherwise use a protective coating; use insulated wires outside.

Ensure that the epoxy perfects the seal, or otherwise lay down a bead of waterproof silicone that can hold pressure. You *will* want to get your chamber level sensor verified *before* you epoxy the cap on.

The screw fitting may require soft silicone sealant or a gasket. Its purpose is to hold pressure and allow periodic inspection of the electrodes. No leaks, no problems.

Make sure you get a symmetric 1–5 mm gap between the two stainless steel pipes. The referenced literature suggests that the closer to 1 mm you get, the better.

Make your solder connections at the wire/electrode junctions nice, smooth and solid. Then apply a waterproof coating, e.g., the epoxy you use for joining the pipes to the screw-cap. This epoxy must be waterproof and capable of holding metal to plastic under pressure.

Control Circuit

Figures 3 and 4 show a simple circuit to control and drive this mini-system. You are going to make a 'square pulse' signal that 'plays' the electrodes like a tuning fork and which you can watch on an oscilloscope. The premise given by the literature is that the faster you want do go down the road, the 'fatter' you make the pulses going into the reaction chamber. Duty cycle will vary with the throttle in the vicinity of 90% mark – 10% space (off/on).

There is nothing sacred about how the pulse waveform is generated; there are many ways to generate pulses, and the attached diagrams show a few. Figure 4 gives the NE555-circuit approach from the referenced patent. The output switching transistor must be rated for 1–5 amps at 12 volts DC (in saturation).

Go with a plan that works for you or your friendly neighbourhood technoid or mechanic, and go get all the circuit elements, including the circuit board, IC sockets and enclosure/box, from your local electronics store such as Radio Shack or Circuits-R-Us. DigiKey has better selection, service and knowledge, plus they have no 'minimum order' requirements.

Be sure to use a circuit board with a built-in ground plane, and to accommodate room for mounting two or three of the gauges. Make sure to get spec sheets on any IC you use. More details of the best circuits to use will be announced, pending prototype testing.

Mounting the reaction chamber in the engine compartment will require running a stub to your pressure gauge where you can watch it. You can easily make 30-gauge wire-wrap connections between the socket pins and through-hole discrete components having wire leads.

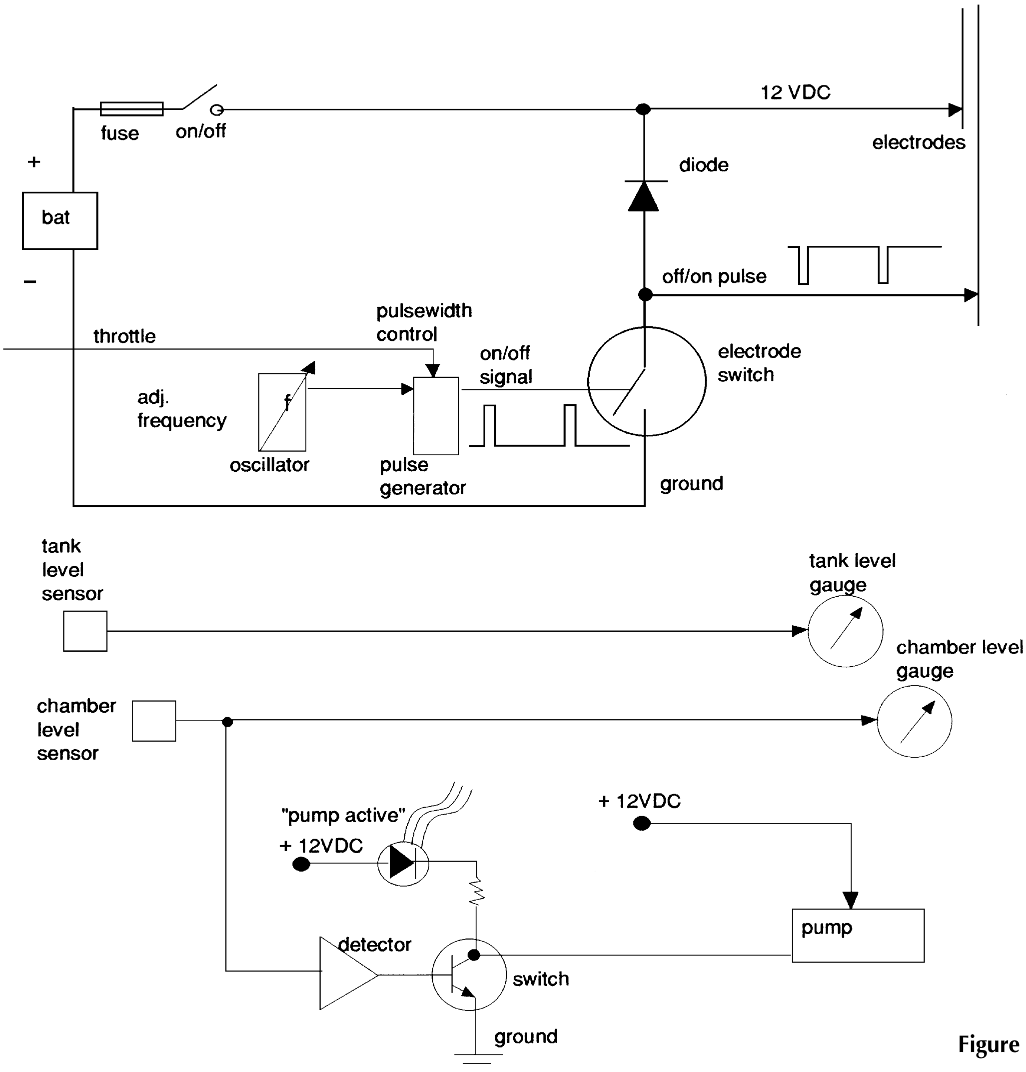


Figure 3

Throttle Control

If you have a throttle position sensor, you should be able to access the signal from the sensor itself *or* from the computer connector. This signal is input to the circuit as the primary control (i.e., throttle level = pulse width = vapour rate).

If you don't have such a signal available, you will have to rig a rotary POT (variable resistor) to the gas linkage (i.e., coupled to something at the gas pedal or throttle cable running to the carb or FI). If you make the attachment at the carb/FI, be sure to use a POT that can handle the engine temp cycles. Don't use a cheap POT; get one rated for long life and mechanical wear. Mount it securely to something sturdy and stationary that will not fall apart when you step on the gas.

Control Range

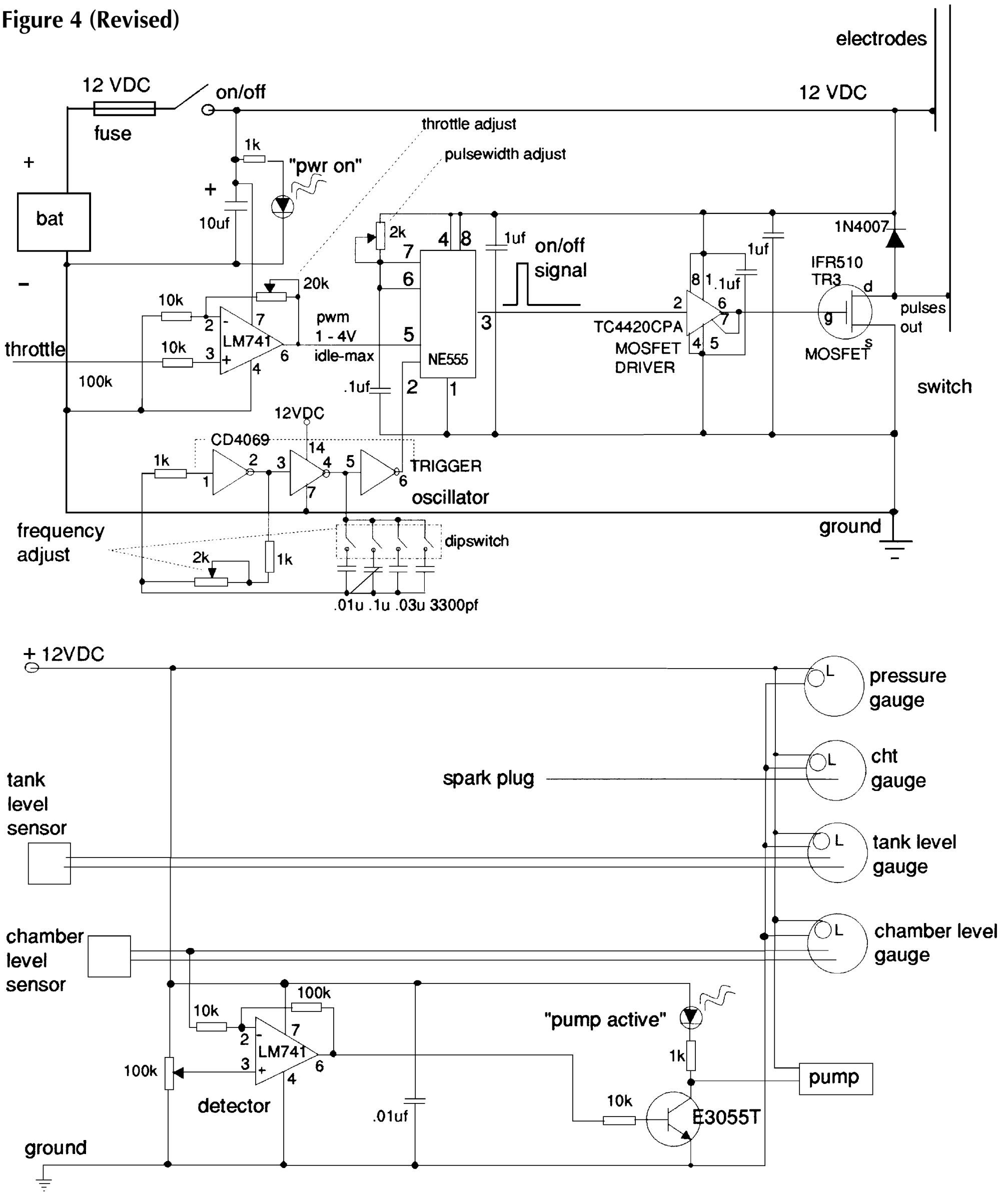
The full throttle *range* (idle to max) *must* control the vapour rate, i.e. pulse width (duty). The resistor values at the throttle signal must allow the throttle signal voltage, say a 1–4 volt swing, to drive the *vapour rate*. You will be using this voltage swing to generate a 10% *on* 'square' pulse. The patent implies using a 'resonant' pulse in the 10–250 KHz frequency range, but it is not explicitly stated so.

In this circuit, you will simply tune to whatever frequency makes the most efficient vapour conversion. You will have to get into the specs for each IC you use, to ensure you connect the right pins to the right wires to control the frequency and pulse width. You can use spare sockets to try out different discrete component values. Just keep the ones that are spec-compatible in the circuit, and get the job done.

You crank up the throttle signal and put more electrical energy (fatter pulses) into the electrodes. Verify you can get 10% duty on the scope (2–100 µsec on the horizontal time-base). Your averaging DVM will display the 90%–10% DC voltage across the output transistor (Vce or Vds or output to ground). Set and connect DVM in the supply current and measure 0.5–5 amps, without blowing the DVM fuse.

Now verify that you got everything you wanted. Verify your wiring connections using your DVM as a continuity detector. Check your wiring, one at a time, and yellow-line your final schematic as you go. You can best use board-mount miniature POTs for anything you want to set and forget. The LEDs are there to give you a quick visual check of normal versus abnormal operation of your new creation.

Figure 4 (Revised)



Carburettor/Fuel Injector Connection

Figure 2 also shows that fittings are required to the carburettor/fuel injector. There are ready-made kits (such as by Impco) available for making your pressure fittings to the carburettor or fuel injector, as the case may be. You will necessarily be sealing the built-in vents and making a one-way air intake.

The copper mesh comprises the 'inadvertent backfire' protection for the reaction chamber. Make sure that all vapour/duct junctions are airtight and holding full pressure without leakage.

Your new 'system' is considered successful and properly adjusted when you get the full power range at lower temperature and minimum vapour flow without blowing the pressure safety valve.

Monitoring with CHT or EGT

Monitor your engine temperature with the CHT (cylinder head temp) or EGT (exhaust gas temp) instead of your original engine temp indicator (if any). Your existing gauge is *too slow* for this application and will *not* warn you against overheating until after you have burnt something. Make sure that your engine runs *no hotter* than in the gasoline arrangement.

VDO makes a CHT gauge with a platinum sensor that fits under your spark-plug against the cylinder head (make sure it is *really clean* before you reinstall your spark plug (as this is also an electrical ground).

Engine/Exhaust Treatment

Get the valves replaced with stainless steel ones *and* get the pistons/cylinders ceramic-treated *asap* when you have successfully converted and run your new creation. Do not delay, as these items will *rust*, either by sheer use or by neglect (i.e., letting them sit).

You could make maximum use of your current exhaust system by using it with your new deal until it rusts through, then have your mechanic or welder friend fit a stainless steel exhaust pipe (no catalytic converter is required). But it could be easier to send your existing exhaust system out for the ceramic treatment, and then simply re-attach it to the exhaust ports.

General Notes

1. Do not discard or remove any of the old gasoline-setup components, e.g., tank, carb/FI, catalytic converter, unless necessary. Better always to leave an easy way to revert to something that at least runs, just in case. Some people are leaving their gasoline setup completely intact and switching back and forth at will, just to have a backup plan.

2. Set your throttle circuit so that you get *minimum vapour flow at idle*, and *maximum vapour flow at full power* without blowing the pressure relief valve. In this way, you control how 'lean' your mixture is by the strength of the pulse (i.e., 'fatness' at the optimum pulse frequency).

3. If you just don't get enough power (at any throttle setting), it means that you need to (a) change the pulse frequency, (b) change the gap between the electrodes, (c) change the size of the electrodes (make them bigger), or (d) make a higher output pulse voltage (as a last resort).

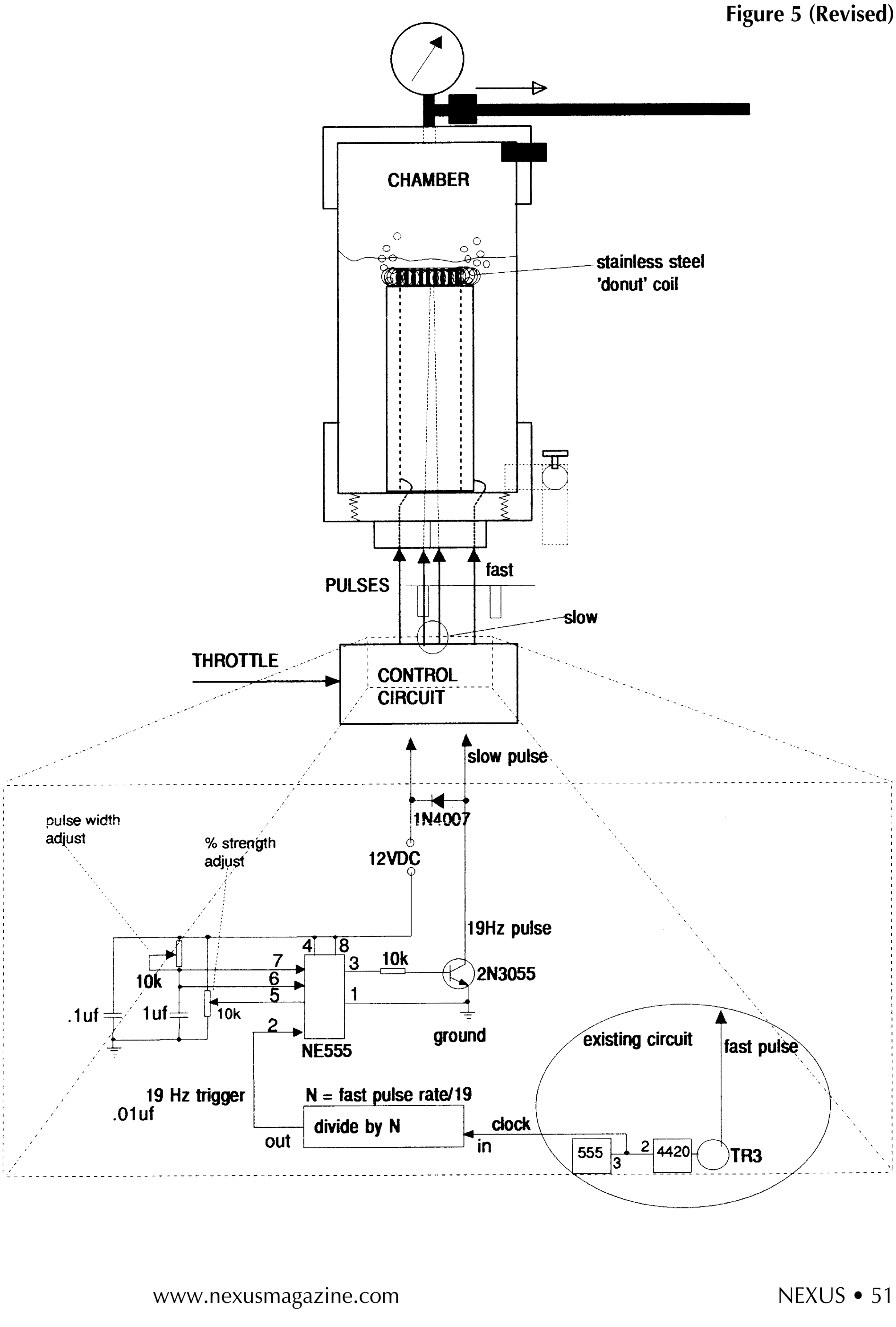
Always use an output transistor, such as a MOSFET, that is rated for the voltage and current that you need to get the job done. Okay, so you may have to play around with it some. Isn't that where all the fun is, anyhow?

4. If you get *any* engine knock or loud combustions (not compensated by adjusting the timing), it means that you need to install an additional coil in the chamber and drive the coil with an additional pulse signal (about 19 Hz on the 0.l sec time-base) (see figure 5). Here, you will be slowing down the burn rate just enough so that the vapours burn throughout the power stroke of the piston.

Be sure to include a board-mount POT to set the correct strength of this second pulse signal into the coil. This is a stainless steel coil of about 1,500 turns (thin wire) that you can arrange like a doughnut around the centre pipe (but *not* touching either electrode), directly over the circular 1–5 mm gap.

You want *no knocking* at any power/throttle setting; smooth power only, but also no excess hydrogen left over from the combustion.

Figure 5 (Revised)



5. Build the canister(s) as tall as you can without compromising your ability to mount them conveniently near the dash panel or in the engine compartment, as the case may be. This way, you can always make the electrodes bigger, if necessary, without undue hardship. Remember that anything in the engine compartment should be mounted in a bulletproof, vibration- and temperature-tolerant fashion.

6. If you have to drill a through-hole for wiring or plumbing through metal, make sure also to install a grommet for protection against chafing. Always watch your chamber pressure range from *idle* (15–25 psi) to *full power* (30–60 psi). Set your safety pressure relief valve to 75 psi and make sure it's rated for much higher.

7. *Shut off* the power switch and pull over if there is *any malfunction* of the system. Your engine will last longest when it still develops *full power plus* at some minimum temperature that we are sure you can find by leaning back the "royal vapour flow" and/or by making use of the water-vapour cooling technique (see figure 6).

Keep good mpg performance records and do periodic inspections and maintenance. Keep it clean; save some money; clean the air; heal the planet. Happy motoring! Tell a friend;. Enjoy your freedom and self-empowerment.

8. There is a lack of documented material for perfecting this vapour system through a fuel injector, but there may be some details you will discover on your own as working prototypes progress. For example, you may be restricted to inject the hydrogen/oxygen vapour *without any water vapour*, as it may rust the injectors. If engine temp and CHT is a problem, then you will want to rethink your plan, e.g., ceramic-coating the injectors. There is always the option of replacing the fuel injector system with a carb.

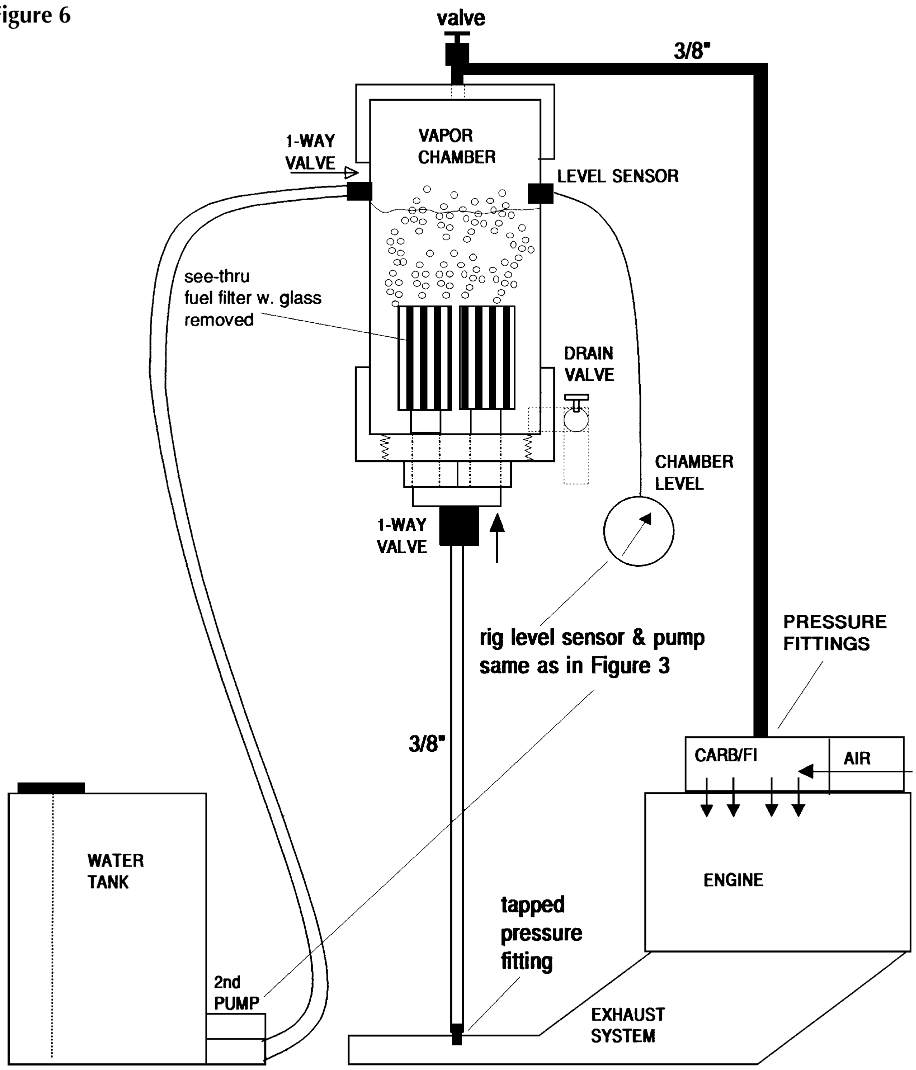
9. If you install the water vapour system (for lower-operating temp/stress), you will want to lean the mixture (vapour/air) for minimum vapour flow rate to achieve any given throttle position (idle to max). Make sure that you get a minimum flow for idle and a modestly sufficient flow for maximum; that does the cooling job without killing the combustion.

10. If you cannot find stainless steel pipe combinations that yield the 1–5 mm gap, you can always revert to alternating plates of +/- electrodes.

11. If you are concerned about the water freezing in your system, you can (a) add some 98% isopropyl alcohol and re-adjust the pulse frequency accordingly; or (b) install some electric heating coils.

12. Do not let *anyone* ever compromise your dream, your freedom, your independence, your truth. ∞

Figure 6



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